



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,921	06/29/2006	Til Aach	DE040021	2355
24737 7590 10/02/2008 PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510				
EXAMINER				
BITAR, NANCY				
ART UNIT		PAPER NUMBER		
2624				
MAIL DATE		DELIVERY MODE		
10/02/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

## Application No.

10/596,921

## Applicant(s)

AACH ET AL.

## Examiner

NANCY BITAR

## Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☒ Claim(s) 8 and 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date 8/14/07
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

1. Claim 12 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 12 defines a “computer program” embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., “When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized” – Guidelines Annex IV). That is, the scope of the presently claimed “a computer program” can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on “computer-readable medium” or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 and 8 teaches “sufficiently filled with contrast medium” is unclear and confusing since it does not delimit clear identification of different phases levels of contrast concentration .It fails to give a reference ( "sufficient for what?).Appropriate correction is required. Claims 2-9 depends on claim 1 and are therefore indefinite.

**Examiner Notes**

4. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-7, 10-12 are rejected under 35 U.S.C. 102 (b) as being anticipated by Qian ET al (US 6,052,476).

As to claim 1, Qian et al. teaches the method of processing a series of x-ray images of an object of interest, wherein the object of interest is visible due to a contrast medium (provides a visualization aid for use with an imaging system including an imaging device, means for stepping the imaging device relative to a patient, and a contrast media injection means, column 5, lines 48-column 6, lines 22). , the method comprising the step of: automatically determining an image of the series of x-ray images where the object of interest is not sufficiently filled with the contrast medium ( wash-in phase determination, column 11, lines 29-column 15, lines 39) .

As to claim 2, Qian et al. teaches the method of claim 1, further comprising the steps of: enhancing parts of the object of interest visible in respective images of the series of x-ray images ( figure 7, column 14, lines 45-column 12, lines 15; vessels in the DSA frame are enhanced so that smaller vessels have the same or similar pixel values as those of larger vessels while maintaining a low pixel value for non-vessel background portions of the image ); preprocessing the respective images of the series of time series x-ray images such that a background of the

object of interest is at least partly suppressed (A "DIFF" (or difference) image is determined based on the difference between any two captured contrast images. Forming DSA and DIFF images is known in the art. Unless stated otherwise, in the specification, a DIFF image in the described exemplary embodiments will be determined based on the difference between two temporally adjacent images, column 7, lines 40-50)

As to claim 3, Qian et al. teaches the method of claim 2, further comprising the steps of performing a morphological filtering; and performing an accentuation of parts of the object of interest visible in the respective image of the series of x-ray images on the basis of a motion of the object of interest (column 2, line 1-column 6, lines 23; figure 16A-figure 16B).

As to claim 4, Qian et al. teaches the method of claim 2, further comprising the steps of: enhancing image information relating to the object of interest on the basis of first and second order derivatives of the respective image of the series of x-ray images (A normalization scale of the enhanced DSA frame can be determined column 12, lines 1-61; note that image enhancement on the basis of derivatives is standard in image processing)

As to claim 5, Qian et al. teaches the method of claim 1, wherein a determination of the image of the series of x-ray images where the object of interest is not sufficiently filled with the contrast medium is performed on the basis of a number of picture elements of the image having a value exceeding a preset threshold value (the vessel weight map is thresholded so that only pixels of the vessel weight map greater than a predetermined threshold value are considered. Next, weighted average vessel intensity is determined. The weighted average vessel intensity value is determined by (i) multiplying the weighted pixel values to be considered (i.e., those

greater than the predetermined threshold) by the values of corresponding pixels of the DSA image, (ii) summing the resulting products to generate a first sum value, (iii) summing the weighted pixel values to be considered to generate a second sum value, and (iv) dividing the first sum value by the second sum value, column 12, lines 21-25).

As to claim 6, Qian et al. teaches the method of claim 1, wherein a determination of the image of the series of x-ray images where the object of interest is not sufficiently filled with the contrast medium is performed on the basis of a histogram analysis, a feature curve analysis and a feature curve segmentation (FIG. 18, a parametric image display area 1830 is provided. In this case, the image was divided into twenty (20) horizontal regions. These regions are depicted in different colors, such that the "wash-in" status region(s), if any, is depicted in a first color, the "approaching maximum opaqueness" status region(s), if any, is depicted in a second color, the "passing maximum opaqueness" status region(s), if any, is depicted in a third color, and the wash-out status region(s), if any, is depicted in a fourth color, column 13, lines 45-67).

As to claim 7, Qian et al. teaches the method of claim 6, wherein the feature curve segmentation is performed by using a maximum likelihood segmentation (FIG. 7, which is a flow diagram of a feature extraction technique 700 which fits image data to a bolus model, a generated DSA image frame may be pre-processed, in steps 702, 704, and 706, to find pixels which belong to a vessel. First, as shown in step 702, vessels in the DSA frame are enhanced so that smaller vessels have the same or similar pixel values as those of larger vessels while maintaining a low pixel value for non-vessel background portions of the image, column 11, lines

46-67, note that using Bayesian method for segmentation is standard and they usually lead to maximum likelihood type solutions).

As to claim 10, Qian et al. teaches the method of claim 1, wherein the method is for determining images of coronary angiograms where the vessel tree of the heart is sufficiently filled with contrast medium (figure 21, column 15, lines 39).

The limitation of claims 11-12 has been addressed above.

#### ***Allowable Subject Matter***

7. Claims 8-9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

#### **Conclusion**

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NANCY BITAR whose telephone number is (571)270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jing Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/  
Supervisory Patent Examiner, Art Unit 2624

Nancy Bitar

9/26/2008